

Claims:

1. A laminate that is not subjected to final consolidation by a binder, comprising:

at least one non-woven mat containing glass staple fibers pre-consolidated with a resin, and at least one non-woven layer of synthetic fibers, wherein the synthetic non-woven layers and the pre-consolidated non-woven mat containing glass fibers are bounded together by needling such that a portion of the fibers of the upper synthetic non-woven layer passes through the non-woven layer containing glass fibers possibly through the underlying synthetic non-woven layer, and wherein the synthetic fibers are heat shrunk and the laminate is binder free.

2. The laminate according to Claim 1, wherein said pre-consolidation resin is selected from the group consisting of urea, acrylate, melamine, phenolic, epoxy, vinyl acetate, polyvinyl alcohol polyvinyl chloride resins.

3. The laminate according to Claim 1, wherein the gsm substance (basis weight) of said layers of synthetic non-woven layers is equal or different.

4. The laminate according to Claim 1, wherein the synthetic fibers are selected from the group consisting of polyester, poly(ethylene terephthalate) and polypropylene.

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5. The laminate according to Claim 1, wherein the synthetic non-wovens fibers are filamentary.

6. The laminate according to Claim 1, wherein the synthetic non-wovens fibers are staple fibers.

5 7. The laminate according to Claims 1, wherein the laminate comprises two filamentary synthetic non-wovens layers and a non-woven containing glass fibers in a sandwich-structure where the ratio of the gsm substance of the two filamentary synthetic non-wovens is 1:1 to 10 1:5.

8. The laminate according to Claim 7, wherein the ratio of the gsm substance of said two filamentary non-wovens is about 1:1 to 1:2.

9. The laminate according to Claim 1, wherein the 15 synthetic non-wovens are mechanically, thermally or hydrodynamically pre-consolidated.

10. The laminate according to Claim 1, wherein, the synthetic non-wovens are not consolidated prior to needling.

20 11. The laminate according to Claim 1, wherein the synthetic non-wovens are ~~are~~ heat shrunk.

12. The laminate according to Claim 1, wherein the non-woven of glass fibers contains 5 to 45% by weight of a binder resin.

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13. The laminate according to Claim 1, wherein the non-woven of glass containing fibers contains 10 to 30% by weight of a binder resin.

14. The laminate according to Claims 1, wherein
5 the laminate is produced at a minor draft in the needle machine.

15. The laminate according to Claim 14, wherein the needle draft is from about 0 to 13 mm/stroke.

16. The laminate according Claim 1, wherein the
10 laminate includes reinforcements.

17. The laminate according to Claim 1, wherein the non-woven containing glass fibers contains glass fibers of the E class, C class, mixtures thereof and ECR glass.

18. The laminate according Claim 1, wherein said
15 synthetic non-woven layer includes filamentary non-woven of polyesters and wherein a part of the polyester filaments penetrate through the non-woven containing glass fibers and to a side opposite that on which the synthetic non-woven layer is disposed and the
20 filamentary non-woven of polyesters is heat shrunken.

19. A method for the production of a laminate of two or more layers, wherein one or more non-woven mat containing glass staple fibers^{or} pre-consolidated with a resin, then disposing said layer beneath or between the
25 non-woven layers of synthetic fibers, wherein the non-

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woven layers of synthetic fibers and the pre-consolidated non-woven mat containing glass fibers are bounded together by needling in such that a part of the fibers of the upper synthetic non-woven passes through the non-woven layer, heat shrinking the synthetic fibers and forming said laminate without final consolidation through the use of a binder.

20. The method of Claim 19, wherein said pre-consolidation resin is selected from the group consisting of urea, acrylate and melamine, phenolic, epoxy, vinyl acetate, polyvinyl alcohol polyvinyl chloride resins.

21. The method of Claim 19, wherein said non-woven layers of synthetic fibers are of equal or different thicknesses.

22. The method of Claim 19, wherein a part of the synthetic fibers of said synthetic layer penetrate said non-woven mat of glass fibers.

23. The method of Claim 22, wherein a part of the synthetic fibers of said synthetic layer penetrate said non-woven layer containing glass fibers and the underlying synthetic layer.

24. The method of Claim 19, wherein the synthetic fibers in the non-woven layer are shrunken prior to bonding with the non-woven layer containing glass fibers.

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25. The method of Claim 19, wherein said synthetic fibers are selected from the group consisting of polyester, poly(ethylene therephthalate) and polypropylene.

5 26. The method of Claim 19, wherein said synthetic non-wovens fibers are filamentary.

27. The method of Claim 19, wherein the synthetic non-wovens fibers are staple fibers.

10 28. The method of Claim 19, further comprising needling of said non-woven mat containing glass staple fibers and the non-woven layers of synthetic fibers with needles that have have a distance between the needle point and the first barb of about 2 to 4 mm.

15 29. The method of Claim 19, wherein said needling is executed with a forward feed ratio for the stroke of less than 14 mm/stroke.

30. The method of Claim 15, wherein said non-woven mat of glass staple fibers is reinforced with longitudinal fibers, yarns or scrim.

20 31. The method of Claim 19, wherein said synthetic non-woven is shrunken at temperatures of 140 to 220°C.

32. The method of Claim 19, further comprising: compressing the laminate with a calender.

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33. The method of Claim 32, wherein said calender is fabric/belt or laminate calender.

34. The method of Claim 15, further comprising shrinking of said laminate at temperatures that
5 corresponds at least to the temperature of a bitumen containing bath used for bituminizing the laminate.

35. The method of Claim 34, wherein said shrinking temperature is up to 30°C above the temperature of the bitumen bath.

36. The method of Claim 19, wherein said non-wovens layer containing glass fibers includes fibers of the E or C class, mixtures thereof and ECR glass.
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37. Method of using the laminate of Claim 1 as support for bituminized roofing felts or damp-proof
15 courses.

38. Method of using the laminate of Claim 1 as support for bitumen shingles.

39. Method of using the laminate of Claim 1 as support for floor covering.

40. The laminate according Claim 16, wherein
10 reinforcements are fibers, yarns running in lengthwise direction or scrim.

41. The laminate according Claim 40, wherein the reinforcements are disposed within or between the layers of the laminate.

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